

# TECHNICAL BULLETIN



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## **SEWING COTTON AND NATURAL BLEND<sup>®</sup> KNIT FABRICS**

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## **INTRODUCTION**

With the demand for product expansion into slacks, blouses, dresses, skirts as well as the ever expanding sport shirt market, optimum sewing conditions for all-cotton and NATURAL BLEND<sup>®\*</sup> knit fabrics become even more demanding. This bulletin outlines certain precautions in sewing these fabrics as well as important considerations for the selection of needles and thread. Stitches and seams are also reviewed with descriptive diagrams.

## **PRECAUTIONS**

With blended and all synthetic knits, certain precautions must be considered to avoid seam damage in the sewing room. For example, problems encountered with sewing polyester result from heat build-up in the needle, which causes unsightly holes in the fabric and missed stitches. Molten material will stick to needles, preventing proper thread movement during the stitching process.

Some cotton and NATURAL BLEND<sup>®</sup> fabrics are chemically finished to impart shrinkage control and durable press appearance properties. Although these finishing systems usually include lubricating agents, such as silicones that improve fabric sewability, a reduction of yarn mobility or tendering sometimes results and this is not often detected prior to sewing. In these cases it might be possible to eliminate yarn damage by using smaller needles, slower speeds and thread lubricants. However, the finished garment may show extensive failure along seams after limited wear or washing exposure. This delayed yarn-breakage problem results from partially severed yarns occurring during sewing that are not immediately evident as needle cuts.

## **NEEDLES**

Yarn cutting most often can be attributed to the sewing needle. Reducing the size of the needle will reduce yarn cutting problems. Figure 1 shows a chart that should be helpful in this regard as it gives a comparison of needle sizes from different companies. Tapered needles, which have a small blade diameter, often are used to replace needles of equivalent strength that are two sizes larger. Generally, lighter weight fabrics of fine yarns are sewn most satisfactorily with small needles.

Ball point needles are generally recommended for all knit fabrics.

## **THREAD**

The sewing thread must be compatible with weight, construction and fiber content of the knit fabric and the needle thickness used to stitch the garment. A guide to selection of thread with respective needles is shown in Figure 2. Spun or cotton wrapped threads are recommended for sewing NATURAL BLEND<sup>®</sup> double knits.

Since ticket sizes stated by different thread manufacturers are sometimes not uniform as to actual thread size, one usually has to match needle and thread by trial selection. One such method includes holding the thread that has been passed through the needle eye on a vertical plane. The needle is then spun and if it does not slip downward,

the thread will not perform in stitch formation.<sup>1</sup>

## **STITCHES AND SEAMS**

Often needle or thread damage is not apparent in the sewing room, but shows up after the garment has been worn a few times. Stitch types should be selected based on fabric construction, seam thickness, needle size, and type of thread to minimize needle cutting.

The elasticity of the seam depends on the number of stitches per inch. Chain stitches stretch more than lock stitches. Pages 5, 6 and 7 show the sequence of assembling typical skirt and slacks for women's wear. Each illustration suggests machine, seam, and stitch type for each particular assembly point.<sup>2</sup>

\* Note: NATURAL BLEND<sup>®</sup> is a registered trademark of Cotton Incorporated for blended products containing a minimum of 60% U.S. upland cotton which have approved performance characteristics.

## **SEWING ROOM CONDITIONS**

The relative humidity of the sewing room is very important when assembling cotton goods. Needle cutting associated with low moisture levels in garment assembly has been particularly prevalent in the winter months. Often fabrics after processing are packed into plastic bags and put in warehouse or inventory in an almost bone dry state. The lack of moisture may reduce the lubricity and resistance to needle cutting. However, moisture can be reintroduced in the sewing plant and the lubricity improved. The percent moisture induced should occur before the actual sewing of the garment to reduce needle cutting. Some plants which produce very fine gauge knit garments have taken steps to maintain a fifty-sixty (50-60) percent relative humidity to help minimize needle cutting. The higher humidity also helps control static. If the hand or touch of the fabric still feels dry or raspy after moisture equilibration, sewing problems can be anticipated.

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<sup>1</sup>What You Need to Know About Fabricating Knits. A Knitting Times Special Feature, Knitting Times, September 1976.

<sup>2</sup>Production Line for Ladies' Slacks and Skirts. Bobbin Publications, Inc., South Carolina, October 1976.

Thickness of blade in millimetre	Schmatz metric system	Singer	Union Special	Reece	Lewis	Dearborn Columbia	Columbia Needle 300(251 lg)	Wilcox & Gibbs	Flatlock Needles 551 (581/2) 555 (581/1)	Morrow Jones'
0.40	40	3								
0.45	45	4								
0.50	50	5	020					4/o-ooo20		
0.55	55	6	022					3/o-ooo22		3/0=000
0.60	60	7			2			2/o-oo 24	1	2/0=00
0.65	65	9	025					0 25	1½	0
0.70	70	10	027	3/0=000	2½	0	5	1 27	2	1
0.75	75	11	030			1	10	30		
0.80	80	12	032	2/0=00	3	1½	15	2 32	3	2
0.85	85	13	034			2	20			
0.90	90	14	036	0	3½	2½	25	3 36	4	3
0.95	95	15	038			3	30			
1.00	100	16	040	1	4	3½	35	4 40		4
1.05	105	17	042			4				
1.10	110	18	044	2	4½	4½		5 44		5
1.20	120	19	047	3	5			6 48		6
1.25	125	20	049					49		
1.30	130	21		4				7 52		7
1.40	140	22	054	5				8		
1.50	150		060					9		8
1.60	160	23								
1.70	170		067							
1.80	180	24								

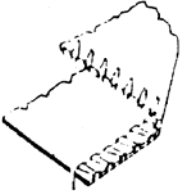
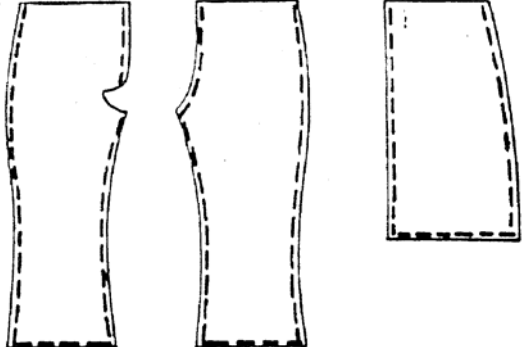

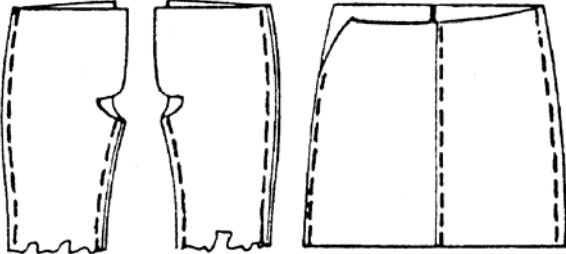
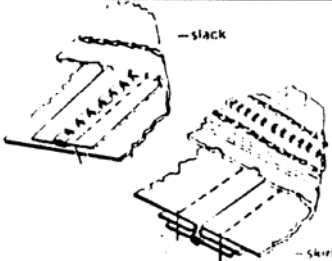
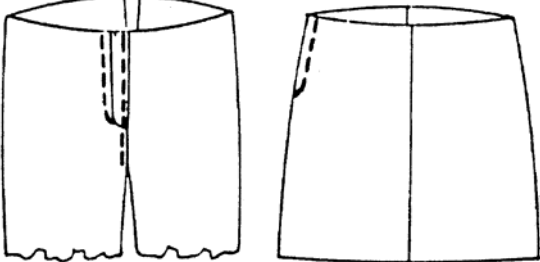
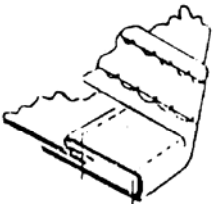
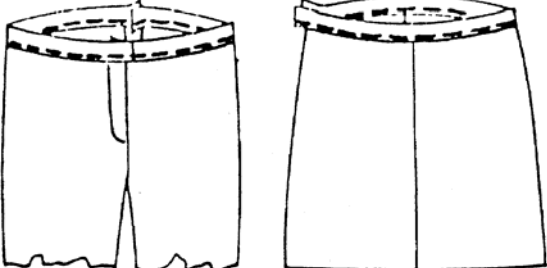
FIGURE 1. Comparison of Needle Sizes<sup>3</sup>


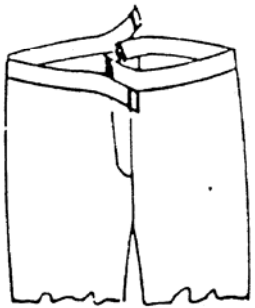

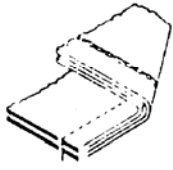
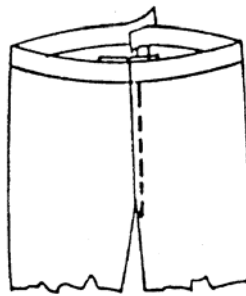
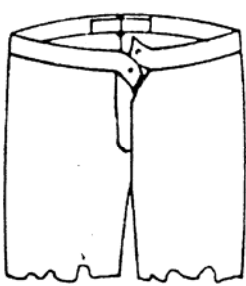


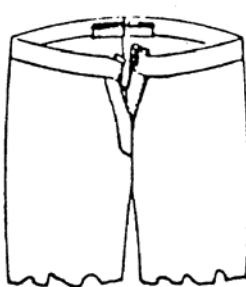

<sup>3</sup>Best of Bobbin, 1975. Bobbin Publications, Inc., South Carolina, 1975.

NEEDLE SIZE	COTTON/POLYESTER CORE SPUN	SPUN POLYESTER	COTTON
8	--	120	120
10	100	100	90,100
12	60-100	70	70,80
14	50	50	50,60


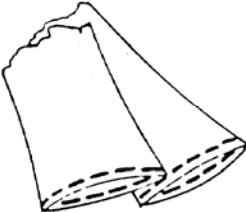
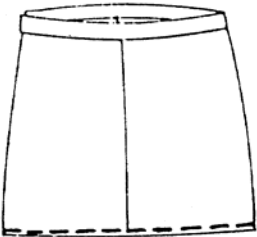
FIGURE 2. Guide for Needle and Thread Selection<sup>4</sup>

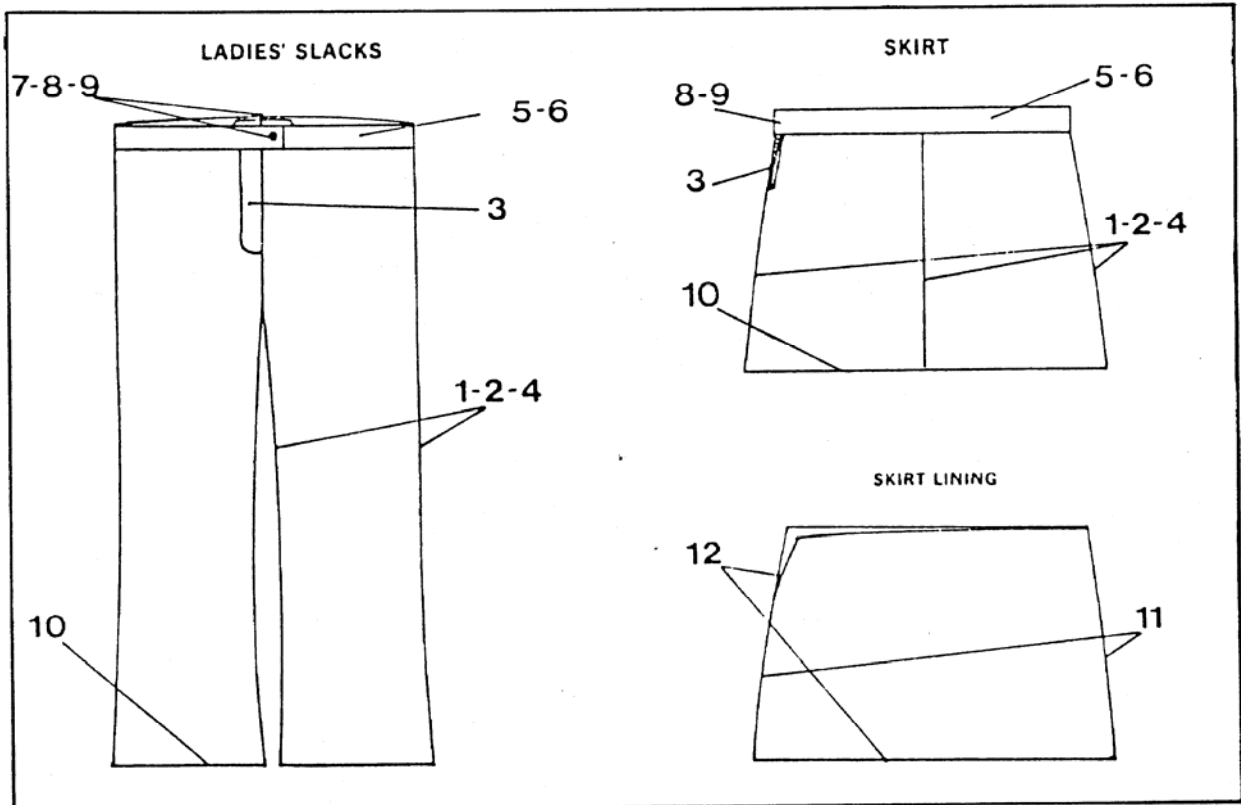
<sup>4</sup>TAC Bulletin, American Apparel Manufacturers Association, Inc., Washington, D.C.

MACHINES AND SEAMS	DESCRIPTION	SLACK	SKIRT
 <p>39500 - Machine EFd-1 - Seam 503 - Stitch</p>	<p>1 Serge front &amp; side panels.</p>		
 <p>56300 - Machine SSa-1 - Seam 401 - Stitch</p>	<p>2 Assembly of seams</p>		
 <p>63900/56300 - Machine LSb-1 - Seam 301/401 - Stitch</p>	<p>3 Set zipper and close front crotch seam (slacks).</p>		
	<p>4 Press assembly seams.</p>		
 <p>56300/63900 - Machine BSr-3 - Seam 301/401 - Stitch</p>	<p>5 Set shaped waistband.</p>		

MACHINES AND SEAMS	DESCRIPTION	OPERATIONS	
		SLACK	SKIRT
 <p>39500 - Machine EFd-1 - Seam 503 - Stitch</p>	<p>6 Serge waistband ends.</p>		
 <p>56300 - Machine SSa-1 - Seam 401 - Stitch</p>	<p>7 Seam seat (slacks).</p>		
<p>MACHINE FOR ATTACHING HOOKS</p>	<p>8 Attach hook and eye.</p>		
 <p>56300 - Machine SSa-1 - Seam 401 - Stitch</p>	<p>9 Make front corners.</p>		



MACHINES AND SEAMS	DESCRIPTION	SLACK	SKIRT
 <p>37500-5 - Machine EF1-1 - Seam 103 - Stitch</p>	<p>10 Hem bottom.</p>		



The statements, recommendations and suggestions contained herein are based on experiments and information believed to be reliable only with regard to the products and/or processes involved at the time. No guarantee is made of their accuracy, however, and the information is given without warranty as to its accuracy or reproducibility either express or implied, and does not authorize use of the information for purposes of advertisement or product endorsement or certification. Likewise, no statement contained herein shall be construed as a permission or recommendation for the use of any information, product or process that may infringe any existing patents. The use of trade names does not constitute endorsement of any product mentioned, nor is permission granted to use the name Cotton Incorporated or any of its trademarks in conjunction with the products involved.

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Cotton Incorporated is a research and promotion company representing cotton worldwide. Through research and technical services, our company has the capability to develop, evaluate, and then commercialize the latest technology to benefit cotton.

- Agricultural research leads to improved agronomic practices, pest control, and fiber variants with properties required by the most modern textile processes and consumer preferences. Ginning development provides efficient and effective machines for preservation of fiber characteristics. Cottonseed value is enhanced with biotechnology research to improve nutritional qualities and expand the animal food market.
- Research in fiber quality leads to improved fiber testing methodology and seasonal fiber analyses to bring better value both to growers and then mill customers.
- Computerized fiber management techniques result from in-depth fiber processing research.
- Product Development and Implementation operates programs leading to the commercialization of new finishes and improved energy and water conserving dyeing and finishing systems. New cotton fabrics are engineered -- wovens, circular knits, warp knits, and nonwovens -- that meet today's standards for performance.
- Technology Implementation provides comprehensive and customized professional assistance to the cotton industry and its customers -- textile mills and manufacturers.
- A fiber-to-yarn pilot spinning center allows full exploration of alternative methods of producing yarn for various products from cotton with specific fiber profiles.
- The Company operates its own dyeing and finishing laboratory, knitting laboratory, and a laboratory for physical testing of yarn, fabric, and fiber properties including High Volume Instrument testing capable of measuring micronaire, staple length, strength, uniformity, color, and trash content.

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